

ALTERNATIVE ENGINEERING CORP.

P. O. BOX 128 - GARDINER, MAINE 04345
(207) 623-8506

THE VIPER-ZGRASS SYSTEM

With over 10 years of custom software development, plus the most advanced hardware features ever offered on a home computer, the Viper Z-grass system has become the most powerful, yet affordable Video Image Processor on the consumer market. This unique system together with the Bally/Astrocade Professional Arcade has a total of 8 microprocessing devices including 3 original Bally/Midway custom arcade graphics processors. (used to make such videogame legends as Pac Man, Galaxians, Wizards of War, Space Invaders, and many more). Unlike the other home computers that play arcade games, the Z-grass computer system not only plays professional arcade games but is also specially designed for writing them. Z-grass makes it easy to create arcade quality games, video art, graphs and beautiful color images on your TV without having to have years of experience in computer programming.

SYSTEM FEATURES:

1. 64K 200ns DYNAMIC RAM MEMORY FOR PROGRAMMING.
2. 32K CUSTOM Z-GRASS REAL TIME OPERATING SYSTEM.
3. DUAL RS232 BI-DIRECTIONAL COMMUNICATIONS PORTS.
4. 8048 MICROPROCESSOR CONTROLLED KEYBOARD WITH 1K ROM DECODER.
5. OAK F.T.M. 81 KEY COMPUTER DESIGNED KEYBOARD WITH KEYPAD.
6. PIEZO ELECTRIC KEY CLICK FOR AUDIBLE KEYBOARD FEEDBACK.
7. 8231 HIGH SPEED ARITHMETIC PROCESSOR UNIT.
8. DUAL 2000 BAUD CASSETTE INTERFACE PORTS WITH MOTOR CONTROL.
9. 4 CHANNEL DOUBLE DENSITY 5.25 FLOPPY DISK CONTROLLER.
10. RFI/EMI FILTER WITH PLUG IN CORD AND BUILT IN FUSE.
11. FULLY REGULATED DC POWER SUPPLIES 5, 12, -12.
12. REAR PANEL JACK FOR REMOTE KEYBOARD OPTION.
13. EXPANDABLE TO HIGH RESOLUTION GRAPHICS. (320*204-COLOR)
14. MEMORY EXPANDABLE UP TO 256K WITH THE HIGH RES. OPTION.
15. COMPATIBLE WITH CP/M OPERATING SYSTEMS.
16. STEREO OUTPUT JACKS FOR THE 3 OCTAVE MUSIC SYNTHESIZER.

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The Viper Z-GRASS unit plugs into all of the following systems:

THE BALLY HOME LIBRARY COMPUTER

THE BALLY PROFESSIONAL ARCADE

THE BALLY COMPUTER SYSTEM

ASTROCADE PROFESSIONAL ARCADE COMPUTER

ASTROVISION PROFESSIONAL ARCADE COMPUTER

Z-GRASS THE LANGUAGE.

The Z-GRASS software includes these advanced functions:

1. A FULL SCREEN TEXT EDITOR FOR FAST EFFICIENT PROGRAM EDITING.
2. STRING MANIPULATION INCLUDING MATCH, CONCATENATION, REPLACEMENT.
3. PROGRAM EXECUTION IN BOTH INTERPRETED AND COMPILED MODES.
4. MULTI-DIMENSIONAL ARRAYS AND STRING ARRAYS.
5. USER CUSTOMIZATION OF LANGUAGE AT SEVERAL LEVELS.
6. ADVANCED GRAPHICS COMMANDS:
SHRINK, TEXT, ELLIPSE, SNAP, SHOW, ROTATE, SCALE, PATTERN, STRIPE, POINT.
7. 6 USER DEFINABLE KEYS FOR SPECIAL OR REPETITIVE FUNCTIONS.
8. OVER THIRTY SPECIAL CONTROL KEY COMMANDS WITH MULTIPLE MODES.

This is only a partial list of all the commands that are included in the 32K of Z-GRASS software. It takes over 100 pages of the Z-GRASS manual to describe all the commands and how to use them. Also included in the Z-GRASS manual are 10 lessons in programming with Z-GRASS, plus information on all the swap modules that can be bought on disk or cassette tape. These swap modules allow the user to get new Z-grass commands as they become available.

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DUAL RS232C COMMUNICATIONS PORTS.

The RS232C dual channel communications ports allow your Viper to communicate with the outside world. These ports can be used with a wide variety of the latest in communications equipment and both channels have independent programmable baud rates. (300 to 38.4k baud) The following devices can be used with these ports.

1. PRINTERS, DOT MATRIX OR LETTER QUALITY.
2. BIT PAD GRAPHICS DIGITIZERS.
3. VOICE SYNTHESIZERS.
4. TELEPHONE MODEMS.
5. REMOTE APPLIANCE CONTROLLERS.
6. COMPUTER TERMINALS.
7. OTHER Z-GRASS COMPUTER SYSTEMS.
8. REMOTE KEYBOARDS.

MICROPROCESSOR CONTROLLED KEYBOARD

The Microprocessor controlled keyboard is a state of the art high speed data entry device. This unique keyboard features an 8 character buffer, repeat key, and microprocessor based multiple key rollover functions with Phantom key lockout. All keys are debounced to prevent unwanted entries. The keyboard has 4 level coding, Shift, Unshift, Capslock, and Control. There are 81 keys in the standard QWERTY arrangement and the life expectancy per key is a 100 million cycles. The switch contacts are front sealed and therefore humidity, dust, and vibration have no effect on proper operation. The top row of keys have been customized for the Z-grass computer system yielding us F1 thru F6 for the special function keys, and four arrow keys for the Z-grass editor. Also included in the system is a Piezo tweeter that clicks each time a key has been depressed to give the user a positive entry response.

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ARITHMETIC PROCESSING UNIT.

The 8231 Arithmetic Processor is an integral part of the high speed graphics capabilities and is offered as an option costing several hundreds of dollars on other computer systems. This chip alone increases the speed of the mathematical computations by up to several hundred times and is therefore essential in producing the real time responses needed for complex graphics simulations.

FUNCTIONS:

1. FIXED POINT SINGLE AND DOUBLE PRECISION. (16/32 bit)
2. FLOATING POINT SINGLE PRECISION. (32 BIT)
3. FULL BINARY DATA FORMATS.
4. ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION.
5. TRIGONOMETRIC AND INVERSE TRIGONOMETRIC FUNCTIONS.
6. SQUARE ROOTS, LOGARITHMS, EXPONENTIATION.
7. FLOAT TO FIXED AND FIXED TO FLOAT CONVERSIONS.
8. STACK ORIENTED OPERAND STORAGE.

Fortunately all of the above mathematical formulas are executed transparently to the user and are completely controlled by the Z-grass software. This device has been manufactured using the most advanced N-Channel Silicon Gate Technology and therefore is extremely fast and reliable.

2000 BAUD DUAL CASSETTE INTERFACE WITH MOTOR CONTROLS.

The Dual 2000-Baud Cassette Interface is used to store and retrieve programs from a cassette recorder. The system includes 2 separate cassette ports with individual motor controls. Having 2 separate systems allows more complex functions to be easily executed. With the computer controlling the motors, one cassette could be audio instructions while the other is loading program material into the computer. The dual motor controls can also be used to let the computer start and stop the cassettes to merge files or select audio or program data.

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5.25 4 CHANNEL FLOPPY DISK CONTROLLER.

The WD1770\ 5.25 Floppy Disk Controller/Formatter from Western Digital is the latest in floppy disk technology. This controller contains a digital data separator and write precompensation circuitry to insure optimum data integrity to and from the disk. This 5.25 floppy disk controller is capable of driving up to 4 disk drives in either single or double density. The total amount of memory capable of being accessed in double density mode with the IBM MFM format would be approximately 3/4 of a million bytes. The Z-grass software is programmed for double density formatting in order to get the most memory storage per disk. Although this floppy disk controller is a custom version for 5.25 disk drives it maintains complete compatibility with its predecessors and therefore can be connected to most any 5.25 disk drive.

POWER SUPPLY FEATURES.

The system power sections include 1 switched 120v 3 prong grounded outlet on the back panel to be used for the Bally/Astrocade wall transformer. This outlet will turn your Bally/Astrocade unit on and off with the Viper Z-grass unit. The front panel on/off switch is illuminated for your convenience and is a good quick reference to insure whether the system is on or off. Because low voltage and power spikes can cause a computer to intermittently fail the Viper has a specially designed microprocessor power transformer that is capable of operating at 100% efficiency even when the power lines drop well below 110 volts. To help protect the system from power spikes the Viper also includes a high efficiency RFI/EMI AC line filter with fuse compartment, and the addition of a M.O.V. (metal oxide varistor) for Hi-Voltage spike protection.

AUDIO MIXING AND STEREO OUTPUTS.

With the Viper Z-grass system you can use either your TV or your stereo sound system to listen to the sound effects of the music synthesizer. You can also play your cassette recorder thru the TV or stereo system thanks to a special circuit in the Viper. With this unique flexibility you have complete voice and music capability for Computer Aided Instruction, Adventure games, and many

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other applications where high quality sound and programs can
interact.